

# PATENT COOPERATION TREATY



From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

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## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) **15 APRIL 2005 (15.04.2005)**

Applicant's or agent's file reference  
**SB05-02**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.  
**PCT/KR2005/000036**

International filing date (day/month/year)  
**07 JANUARY 2005 (07.01.2005)**

Priority date(day/month/year)  
**17 MARCH 2004 (17.03.2004)**

International Patent Classification (IPC) or both national classification and IPC  
**IPC7 H01L 33/00**

Applicant

**OPTOWAY, Inc. et al**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.  
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR

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Form PCT/ISA/237 (cover sheet) (January 2004)

WRITTEN OPINION OF THE  
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Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1-16	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	7-16	YES
	Claims	1-6	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims	NONE	NO

**2. Citations and explanations :**

(1) The documents cited in the International Search Report:

D1 : US 2001/0048113 A1    D2 : US 6504180 B1  
D3 : US 2003/0062530 A1    D4 : KR 2005-0003871 A

(2) Inventive Step

The subject-matter of claims 1-6 is about an LED device in which an ultra-fine prominence and depression structure is provided on a part of the p-type or n-type semiconductor layer.

But, D1 discloses a surface-emitting light-emitting diode having increased light emission characteristics. The surface-emitting light-emitting in D1 includes a substrate, an active layer, an upper and a lower clad layer formed on and below the active layer respectively, a lower contact layer, and an upper contact layer formed on the light generating layer and having an uneven surface portion (The abstract, figures 1-9 and claim 1). And the shape of the uneven surface is also described in D1. According to D1, the light is condensed by the uneven surface portion formed on the p-type semiconductor layer and thus the amount of light which is totally reflected internally is reduced.

In addition, D2 discloses a light emitting device having a waveguide surface structure extending in two dimensions and having a roughened surface structure (122 in figure 12) with a random grating structure.

As mentioned above, the features of claims 1-6 are included among the several straightforward possibilities or combinations from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of claims 1-6 lacks an inventive step under PCT Article 33(3).

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**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

The drawings of figures 2-4 and 6-8 are not clear.

They are not properly explaining the invention nor concied to the description of the invention.

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**Supplemental Box**

**In case the space in any of the preceding boxes is not sufficient.  
Continuation of:**

BOX V.

However, the technical features of claims 7-16 of this application are not disclosed in D1 nor in D2, so it is believed that the subject matter of claims 7-16 has an inventive step under PCT Article 33(3).

(3) Industrial Applicability

The present application is believed to be industrially applicable according to PCT Article 33(4).